Dataset Expocode	**AG5W20150328**
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Dataset	**Funding Info:** NOAA Climate Program Office - Climate Observation Division **Initial Submission (yyyymmdd):** 20160129 **Revised Submission (yyyymmdd):**
Campaign/Cruise	**Expocode:** AG5W20150328 **Campaign/Cruise Name:** CB2015_03 **Campaign/Cruise Info:** VOS Line Cap Blanche **Platform Type:** **CO2 Instrument Type:** Equilibrator-IR or CRDS or GC **Survey Type:** VOS Lines **Vessel Name:** Cap Blanche **Vessel Owner:** Hamburg Sud **Vessel Code:** AG5W
Coverage	**Start Date (yyyymmdd):** 20150328 **End Date (yyyymmdd):** 20150410 **Westernmost Longitude:** 177.6894 E **Easternmost Longitude:** 118.0223 W **Northernmost Latitude:** 32.0311 N **Southernmost Latitude:** 36.5413 S **Port of Call:** Long Beach, CA **Port of Call:** New Zealand
Variable	**Name:** xCO2W_PPM **Unit:** ppm **Description:** Mole fraction of CO2 in the equilibrator headspace (dry) at equilibrator temperature (ppm)
Variable	**Name:** xCO2A_PPM **Unit:** ppm **Description:** Mole fraction of CO2 measured in dry outside air (ppm)

Variable	**Name:** xCO2A_INTERPOLATED_PPM **Unit:** ppm **Description:** Mole fraction of CO2 in outside air associated with each water analysis. These values are interpolated between the bracketing averaged good xCO2_ATM analyses (ppm)
Variable	**Name:** PRES_EQUIL_hPa **Unit:** hPa **Description:** Barometric pressure in the equilibrator headspace (hectopascals)
Variable	**Name:** PRES_SEALEVEL_hPa **Unit:** hPa **Description:** Barometric pressure measured outside, corrected to sea level (hectopascals)
Variable	**Name:** EqTEMP_C **Unit:** Degree C **Description:** Water temperature in equilibrator (degrees Celsius)
Variable	**Name:** SST(TSG)_C **Unit:** C **Description:** Sea surface temperature
Variable	**Name:** SAL(TSG)_PERMIL **Unit:** ppt **Description:** Sea surface salinity on Practical Salinity Scale (permil)
Variable	**Name:** fCO2W@SST_uATM **Unit:** uATM **Description:** Fugacity of CO2 in sea water at SST and 100% humidity (microatmospheres)
Variable	**Name:** fCO2A_uATM **Unit:** uATM **Description:** Fugacity of CO2 in air corresponding to the interpolated xCO2 at SST and 100% humidity (microatmospheres)
Variable	**Name:** dfCO2_uATM **Unit:** uATM **Description:** Sea water fCO2 minus interpolated air fCO2 (microatmospheres)
Variable	**Name:** fCO2_FLAG **Unit:** None **Description:** Quality control flag for fCO2 values (2=good, 3=questionable)
Sea Surface Temperature	**Location:** Ship's bow intake, ~5 meters below water line **Manufacturer:** Seabird **Model:** SBE38, serial number 3848581-0383 **Accuracy:** 0.001 (°C if units not given) **Precision:** 0.00025 (°C if units not given) **Calibration:** Yearly factory calibration **Comments:**
Sea Surface Salinity	**Location:** Ship's bow intake , ~5 meters below water line **Manufacturer:** Seabird **Model:** SBE38, serial number 3848581-0383 **Accuracy:** .005 **Precision:** .0005

	Calibration: Yearly factory calibration **Comments:**
Atmospheric Pressure	**Location:** Ship's bow, ~10 meters above sealevel **Normalized to Sea Level:** yes **Manufacturer:** GE **Model:** Druck **Accuracy:** .15 hPa (hPa if units not given) **Precision:** .01 hPa (hPa if units not given) **Calibration:** Factory calibration **Comments:**
Atmospheric CO2	**Measured/Frequency:** yes, 6 samples every 3 hours **Intake Location:** Ship's bow, ~10 meters above sea level **Drying Method:** Thermoelectric condensor; Perma Pure (Naphion); magnesium perchlorate. 90% dry **Atmospheric CO2 Accuracy:** .01 ppm **Atmospheric CO2 Precision:** 0.2 ppm
Aqueous CO2 Equilibrator Design	**System Manufacturer:** General Oceanics 8050. PMEL system ID: GO7 **Intake Depth:** ~5m below water line **Intake Location:** Ship's bow intake **Equilibration Type:** GO8050 Showerhead equilibrator, jacketed **Equilibrator Volume (L):** 0.95 L (0.4 L water, 0.55 L headspace) **Headspace Gas Flow Rate (ml/min):** 70 - 100 mL/min **Equilibrator Water Flow Rate (L/min):** 3 L/min **Equilibrator Vented:** Yes **Equilibration Comments:** **Drying Method:** Thermoelectric condensor; Perma Pure (Naphion); magnesium perchlorate. 90% dry
Aqueous CO2 Sensor Details	**Measurement Method:** IR **Method details:** Infrared absorption of dry sample gas **Manufacturer:** Licor **Model:** Licor 7000, Serial number IRG4-0560 **Measured CO2 Values:** xCO2(dry) **Measurement Frequency:** Every 120 seconds **Aqueous CO2 Accuracy:** 1 uatm **Aqueous CO2 Precision:** 2 uatm **Sensor Calibrations:** The sampling and analyzing methods of the Neill/General Oceanics Underway pCO2 systems are described in detail in: Pierrot, D.; Neill, C.; Sullivan, K.; Castle, R.; Wanninkhof, R.; Luger, H.; Johannessen, T.; Olsen, A.; Feely, R.A.; and Cosca, C.E. (2009). Recommendations for autonomous underway pCO2 measuring systems and data-reduction routines. Deep-Sea Res., II, v. 56, pp. 512-522. **Calibration of Calibration Gases:** Mooring **Number Non-Zero Gas Standards:** 4 **Calibration Gases:** LL83535, 246.77 ppm; LL108050, 399.22 ppm; LL108059, 496.103 ppm; LL154371, 628.59 ppm Frequency of calibration: every 7 hours **Comparison to Other CO2 Analyses:**

	Comments: **Method Reference:** Pierrot, D., C. Neil, K. Sullivan, R. Castle, R. Wanninkhof, H. Lueger, T. Johannessen, A. Olsen, R. A. Feely, and C. E. Cosca (2009), Recommendations for autonomous underway pCO2 measuring systems and data reduction routines, Deep-Sea Res II, 56, 512-522.
Equilibrator Temperature Sensor	**Location:** Hart Scientific model 1521 digital thermometer, serial number A77488, with an NIST traceable model 5610 thermistor probe, serial number A690613. Accurate to ± 0.01°C. **Manufacturer:** Hart Scientific **Model:** Hart Scientific model 1521 digital thermometer, serial number A77488, with an NIST traceable model 5610 thermistor probe, serial number A690613. **Accuracy:** 0.015 (°C if units not given) **Precision:** 0.001 (°C if units not given) **Calibration:** Factory calibrated **Comments:** Hart Scientific model 1521 digital thermometer, serial number A77488, with an NIST traceable model 5610 thermistor probe, serial number A690613. Accurate to ± 0.01°C.
Equilibrator Pressure Sensor	**Location:** Inside equilibrator **Manufacturer:** Setra **Model:** Setra 239 differential pressure transducer **Accuracy:** 0.052 (hPa if units not given) **Precision:** 0.01 (hPa if units not given) **Calibration:** Factory calibrated **Comments:** Setra 239 differential pressure transducer, accurate to ± 0.15 hPa. The equilibrator was passively vented to a secondary equilibrator, and the Licor sample output was vented to the laboratory when CO2 measurements were made, thus equilibrator headspace pressure was assumed to be laboratory pressure. Pressure in the laboratory was measured with a GE Druck barometer, serial number 3013024, with an accuracy of ± 0.01 %fs.
Additional Information	**Suggested QC flag from Data Provider:** NB **Additional Comments:** **Citation for this Dataset:** Cosca, Catherine E.; Feely, Richard A.; Alin, Simone R. (2016). Partial pressure of carbon dioxide (pCO2), temperature, salinity and other variables collected from surface underway observations using shower head equilibrator, carbon dioxide gas detector, and other instruments from 4 trans-Pacific crossings onboard container ship Cap Blanche in the Pacific Ocean from 2015-03-28 to 2015-12-04 (NCEI Accession 0141304) **Other References for this Dataset:** NCEI Accession 0141304